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NUMERICAL AND THEORETICAL INVESTIGATIONS OF NORTH PACIFIC SUBTROPICAL MODE WATER AND ITS ROLE IN PACIFIC CLIMATE VARIABILITY

To better resolve the role of Subtropical Mode Water (STMW) in the exchange of information between the atmosphere and the ocean linked to climate variability, high resolution MIT General Circulation Model (MITgcm) simulations are used to study the formation, evolution, dispersal of STMW and thereby STMW's role in Pacific climate variability. During a 171-month time period (from Jan 1992 to Mar 2006), the seasonal variability is the dominant temporal pattern observed. From climatological model fields, STMW exhibits unique features in time and space. This can be seen more clearly by dividing the cycle into three distinct time periods: the formation, the isolation and the dispersion periods. In addition to seasonality, there is also a distinct interannual signal observed in STMW. This variation pattern is connected closely to the climate shifts of North Pacific. Further investigation shows high correlation between the STMW variability and the Pacific Decadal Oscillation index. Implications of the role of STMW in decadal variability are explored as well as investigation into possible dynamics and mechanisms with the use of a Planetary Geostrophic Ocean Model.

Poster presentation

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[Back](#)